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EDITORIAL

FOOT-AND-MOUTH DISEASE

FROM time to time we have drawn the attention of our readers to the part which the veterinary profession has to play in the control of all health and disease problems of livestock: it includes not only the application of methods of control, but must also involve the study of the cause and the devising of methods and techniques which make control a practical proposition. Important and far-reaching as the work has been, the end of the road is still far off. No better example can be cited than the present pandemic of foot-and-mouth disease which is now occurring in many European countries, and, in some at least, does not yet seem to be under control. It would appear, therefore, that the methods now in use are not proving entirely satisfactory in coping with the situation. We must ask ourselves the reason.

A point that comes to our minds at once is the origin of the recent invasions. Is foot-and-mouth disease virus always present in some European countries, or is it imported from other parts of the world, attacking susceptible animals, primarily as a mild infection, spreading later to other animals and so increasing in virulence? Or, are the vaccination schemes really failures because they tend to mask symptoms and create carriers of infection? Again, what of the virus itself? For many years we have been given to believe that there existed three

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distinct antigenic types, A, O and C. It was reasonable to assume that vaccine, of high immunising value, prepared from a type, would be effective in the field against that type, and that animals injected with vaccine of all three types would completely resist infection in the field by any of the three types of virus. We understand now that vaccines as used in the past are proving ineffective in controlling the spread of the infection, and are informed that variations within the types, especially the A type of virus, have occurred: no fewer than six variants have already been described, some of which are said to be antigenically different from the others. This variation or mutation of the type of virus is given as a reason for the failure of vaccine to hold and control the steady and rapid progress of the disease, which is now overrunning a number of countries in Europe.

In Great Britain, the slaughter or "stamping-out" policy continues to be practised in dealing with the disease, and although, at the time of writing, some seventy outbreaks have been confirmed within the past few weeks, this figure is out of all proportion to the many thousands of outbreaks reported in other countries during the past few months. Foot-and-mouth disease, when prevalent on the Continent of Europe, must always be regarded as a danger to Great Britain and a potential danger to countries even further afield.

The control of foot-and-mouth disease is an international concern: research on its origin in countries must be energetically pursued. So long as the infection persists in a country, livestock in other countries and in the whole world are in danger. We plead for international collaboration in the study of the disease and its cause from all possible angles—in the laboratory and in the field. We plead for action *now* whereby the best available veterinary research workers and administrators will get together and study the all-important problems associated with the disease and its spread, so that even although the ravages of the present pandemic may be overcome at a relatively early date, control measures will be worked out and agreed internationally, with the result that widespread outbreaks will be prevented in the future.

We extend to our readers Greetings and Good Wishes for 1952. It is difficult to forecast what is in store for a country or for the world, but the work of the Veterinary Profession in controlling health and disease of livestock must play an important part in the efforts being made to obtain in the world a position whereby food will be available in the necessary quantities for the human populations: and so to erect one of the pillars on which a peaceful world can be built.

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SPECIAL ARTICLE

HISTORY OF THE VETERINARY PROFESSION 1851-1951

(a) The Year 1881 as a Great Landmark in the Modern History of the British Veterinary Profession; The Chief Leaders in Successful Reform, with Particular Reference to John Henry Steel

By J. T. EDWARDS, D.Sc., M.R.C.V.S.

> *"It is prodigious the quantity of good that may be done by one man if he will make a business of it."*—DR. SAMUEL JOHNSON.
>
> *"The number of years a person lives in this world is of no consequence—but even a day spent in true service of mankind is of supreme importance."* —MAHATMA GANDHI.
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> "JOHN HENRY STEEL Memorial. *Founded in* 1892 *in memory of John Henry Steel* (1855-1891), *B.Sc., F.R.C.V.S., Army Veterinary Department, Principal of the Bombay Veterinary College, 'to perpetuate the memory of an earnest worker, so that his example may incite others, and to benefit the profession by encouraging and rewarding merit.'"*—THE REGISTER OF VETERINARY SURGEONS: Honours and Prizes (heading the list, p. 70).

I

"THE project of assembling the members of the veterinary profession for the discussion of urgent and important professional topics originated with the small body of veterinarians which attended the sittings of the British Medical Association as held in Cambridge during August, 1880. . . ."

So read the Secretary, John Henry Steel, in the opening sentence of his "Report of the Origin and Progress of the Congress"—"THE BRITISH NATIONAL VETERINARY CONGRESS"—which held its sittings on July 20 and 21, 1881, in the lecture theatre of the Society of Arts, John Street, Adelphi, London.

The concluding sentence of that historic Report reads: ". . . With voluntary labour and careful management of funds the Congress expenses have not proved great, and the amount of support by members and friends of the veterinary profession has proved most satisfactory, and will, we hope, fulfil the design of the originators, '*that the Congress of 1881 shall prove an era in the veterinary history of Great Britain and Ireland with their Colonies*'" (Steel's italics).

Writing in this journal in 1891 (*Vet. Jl., 32,* 146) in an obituary tribute to Steel—after his death at the early age of 35, on January 20, 1891, at Bombay—the great veterinary reformer, George Fleming, who had presided over the sittings of the above British National Veterinary Congress in 1881, said:

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"*. . . it was owing to his [Steel's] efforts that the National Veterinary Association was begun; he was its first Secretary . . .*" (our italics). And, again: ". . . Those who knew him, the work he has accomplished, and the phenomenal enthusiam and ability which he brought to bear on everything he undertook, will agree with us in mourning his untimely death, and in the opinion that, by his bereavement, veterinary science has lost an earnest and a talented devotee. . . ."

The shock of the news of Steel's untimely death likewise moved that great-hearted man, William Hunting, to write at the same time in our contemporary, *The Veterinary Record* (1891, January 24, p. 361): ". . . It is common for Englishmen to die at their posts in India, and when the excitement and glory of war surround them their loss may be recorded with hardly a note of sadness. Far otherwise is it when an active devotion to duty and an almost reckless disregard of self impel a high-minded and noble character to persist in carrying on the daily routine work of an institution which is only half appreciated and which is so situated that health and life are sorely and certainly undermined. Bombay will doubtless be the better for the work of John Steel, but it has robbed the veterinary profession of one of its brightest intellects, and consigned to a premature grave one of the most lovable and unselfish of men. . . ."

II

The year 1881 was an *annus mirabilis* in the history of the veterinary profession of this country. It is precisely at this date, 60 years later, its Diamond Jubilee, that we can discern it clearly, in the light of history, to have been such a year. It would have been hardly possible to have attributed to it such significance at an earlier date. There are at least three good reasons now evident which entitle it to stand forth in retrospect as a year reflecting exceptional progress both in the consolidation of the veterinary profession and in the advance of veterinary medicine.

Firstly, the passing of the Veterinary Surgeons Act, 1881, for the first time legalised the profession by giving it statutory recognition. And, although it was (as became only too obvious in the course of time) only a "half-measure" so far as giving the profession the necessary full protection against the competing claims of unqualified practitioners was concerned, yet, all the same, among its benefits could be counted the real gain achieved in so far as it protected at law the title of veterinary surgeon against usurpation by such people. The Charter of 1844, which had recognised those who held the diploma of the Royal College as belonging to a profession, was slowly realised to confer no such protection at law. But there were other great benefits from the Act, at least one of which excited the genuine envy of other professions, and especially of the medical profession, whose affairs in that respect were, and remained, chaotic. That was the benefit hard won in bringing the qualifying examinations leading to registration under the direct control of the Royal College, which was itself

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JOHN HENRY STEEL, 1855-1891.

entrusted with the conduct of examinations, as well as with the prescribing of the curriculum of studies at all the affiliated colleges and schools. We need not pause to discuss whether or not when the stage was reached at which further legislation was called for to modify the 1881 Act, the foregoing controls had outlived their usefulness. As yet it is far too soon not only to assess the merits of the 1948 Act in the light of history but also to make any proper contemporary comments upon it. What we can be now certain upon is that what the veterinary profession acquired as the result of the passing of the 1881 Act were advantages for which it must for ever lie under a deep debt of gratitude to the few pioneers, in particular Fitzwygram and Fleming, who had the vision and courage to secure them for us.

Secondly, the British Veterinary Congress of 1867, to which we directed attention in the preceding instalment in this series, and which was promoted mainly by George Bodington of Cardiff, failed to perpetuate itself. By the date of the promotion of the 1881 Congress the profession seems to have forgotten, during the interval, about it. We need to dwell, in the present instalment, upon the circumstances which were propitious to the continuance of the later Congress until it was destined to reach the standing which it has assumed to-day; that is, of a powerful, well-organised, federated Association —the British Veterinary Association—wielding an influence on the life of the profession without which it is hard to see how otherwise the profession, as a genuine profession, and not as a mere lowly-placed appanage of State officialdom, could hope to survive. Conspicuous within that survey must be placed a short review of the life and work of John Henry Steel, who had correctly divined, as we have seen, that the Congress of 1881 was designed to mark a "new era" in our veterinary history.

Thirdly, more notable than either of the foregoing episodes, which were essentially of domestic concern to the veterinary profession itself, were achievements of universal concern that have never until now been appraised at their true or full value. At the beginning of the present year, the writer was privileged to bring into relief, both in our contemporary *The Veterinary Record* and in this journal, the truly enormous contribution which the profession made, almost unbeknown even to the great majority of its own members, to the early stages of the wholly transformed scene in regard to both the prophylaxis and therapy of disease as it has, almost miraculously, unfolded itself before our eyes within hardly longer than a decade. The very first article which was published in the 1881 volume of this journal was the epoch-making report of Griffith Evans's researches in the Punjab into the horse disease known as *surra.* Then there followed Steel's confirmation of Evans's discovery in 1885 in the course of his investigation of what he termed "relapsing fever" among mules in Burma. After the above two veterinarians had opened up the field by a new form of approach to the treatment of disease, there came Lingard's pioneer researches at Poona from 1890 onwards in which search for remedies was directed towards the elimination of the microparasite rather than the amelioration of symptoms; which, when taken up later by Ehrlich, led to the establish-

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ment of the new discipline, "chemotherapy," the fruits of which are now being garnered in ways and to an extent that we certainly do not need to recapitulate: never, however, as a profession can we reiterate too often the true genesis of this enoromous advance.

During the Christmas week of this year, that is, almost precisely at about the date of publication of this issue of this journal, the Diamond Jubilee of the Bombay Veterinary College will be celebrated. It was founded by Steel and it was the first college of its kind in India to turn out veterinary graduates after a full and comprehensive training. The present writer was invited to contribute a message for those celebrations. He hopes that message will be accepted in the form of the present tribute to the talented man of noble character who brought the College into existence. Had he survived, from all the testimony we have now been able to discover, there is no question whatsoever but that India would have been blessed from the outset with a strong cadre of veterinarians educated up to the most advanced standards prevailing anywhere in the world. For many years, unfortunately, there was not recruited to the Indian services anyone with Steel's absorbing passion to provide India through his own efforts as an organiser, teacher, and all-round worker, with a cadre of Indian veterinary graduates that need not fear comparison. In his determination to let nothing stand in his way to achieve that end he unquestionably martyred himself. We shall need to revert to this theme. For it is quite clear that, whatever discoveries were made by individuals in India, no solid or lasting advance could be achieved (as was clearly seen by the Islington Commission which reported just after the outbreak of the first world war) until the Indians themselves were educated up to the highest possible standards. After Steel's day they had to be content with something much below those standards.

III

To trace adequately the history of developments leading up to the passing of the 1881 Act would take up much more space than is at our disposal in this issue. Indeed, the main features of that history are generally so well known or are so readily accessible that to dwell upon it is not, at any rate, pressing. Some points in the history of events between the Congress of 1867 which failed to take root, and that of 1881, which took root, albeit not in fertile soil, for the next thirty years, however, call for elucidation. A great deal of misunderstanding has arisen through failure to realise what a great deal was missed by the profession through the lack of a free, well-organised body such as the British Veterinary Association has become to-day.

What took place at that historic meeting of the British Medical Association at Cambridge in 1880 to which Steel referred in his report already quoted is all-important for our proper understanding.

So far as we have been able to trace from the attendance list and the reports of the Public Medicine Section (*Brit. Med. Jl.*, 1880, *2*, 395, 290, 465) there were but three men who constituted what Steel called the "small body of veterinarians present," namely, George Fleming, of the Army Veterinary

Department and then President of the R.C.V.S., and John Henry Steel and George Amos Banham. Both Steel and Banham had been students of outstanding brilliance at the London College, Steel being the winner of the first award of the Fitzwygram Prize, in 1875, and Banham being winner of the prize and heading the list in the next year, 1876. (Parenthetically, next Banham and below him that year was John McFadyean, of the Dick College, Edinburgh.) Steel, in 1880, occupied the post of Demonstrator of and Lecturer on Anatomy at the London College, while Banham was Veterinary Surgeon to the Brown Institution, London, which had been founded 10 years previously, and wherein had worked a number of the most eminent pioneers in medical research in this country. It was a tragedy that Fate ordained that these three men were not destined to continue long working together.

Most remarkable, however, about the 1880 meeting of the B.M.A. was, besides the fact that Lister contributed to it some of his epoch-making pronouncements on antisepsis, the perhaps less dramatic but equally portentous information that at last public health had become solidly established as a matter of prime national concern. Our own profession was not overlooked or ignored by the medical profession, at least by those eminent leaders within it who were striving to enlist every means to organise public health measures on a sound national basis. Far from it: it was just that the profession itself did not rise to the occasion. The one man who was invited to participate as a contributor to the discussions in the Public Health Section was Fleming; and read even to-day, considering that Koch's discovery of the tubercle bacillus had to wait four more years, Fleming's paper on "Bovine Tuberculosis in Relation to the Public Health" as a contribution to the discussion on "What Diseases are Communicable to Man from Diseased Animals used as Food" would read strangely complete in itself if it were not for the contemporary experience that adequate preventive measures had been devised for the most devastating virus diseases of animals long before, in 1936, we had obtained a glimmer as to what is the real nature of the viruses themselves. The staffs of the veterinary schools were entirely ignored: there was hardly a man among the senior members of the teaching staffs but was engrossed exclusively in what was the narrow remunerative pursuit of the time in horse practice. Reading very carefully into all the evidence that was soon to cause Steel to find conditions intolerable at the London College and had caused his associate Banham already to seek to gratify his ambitions outside the College, one cannot but discern that at the bottom of it all was the sinister manœuvring of what the late J. A. W. Dollar termed to us "an old gang" at the College bent on preserving at all costs their narrow self-interests. Hence it was that in default of any other worthy veterinary exponent, a distinguished army veterinary surgeon pleaded the cause of the profession before the B.M.A.; the pleading inspired two rising young men; though they were pilloried for their pains, the "National," as we know it to-day, we owe to them.

Some passages from the remarks of the distinguished President of the Public Medicine Section, Dr. (later Sir) Henry Wentworth Acland, the Regius Professor

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of Medicine in the University of Oxford and President of the General Medical Council, merit reproduction :—

". . . It was not without intention that Mr. Fleming was requested to follow Mr. Vacher [the medical officer for Birkenhead]. It was of great importance that it should be clearly understood by the public, as it was by scientific men, that the study of the pathology of domestic animals could not be wholly or properly separated from that of man and *vice versa*. Anyone who heard, or who would read, Mr. Vacher's and Mr. Fleming's remarks on this subject, as well as those contained in various of Mr. Simon's Reports [on the public health of London], in the American National Health Reports, and in numerous original works, would be entirely convinced of this. It was for this reason that he (Dr. Acland) had long urged the formation of a well-endowed Chair in Oxford of General and Comparative Pathology, one that should systematically treat of all that was established, old and new, in regard to animal diseases; and should carry on researches therein. Oxford, being in the centre of an agricultural district, would be in some respects a very suitable locality. . . . The Chairs of Physiology, Comparative National Health, and General Comparative Pathology, with proper laboratories and appliances, were all needed at the present day for the biological series, and even then were inadequate to the vastness of the subjects involved. . . . He cordially endorsed the remarks of Mr. Fleming as to the importance of Government understanding this subject. And Government would come to understand it if they went on steadily working together in their several departments, harmoniously and without exaggeration, for nothing repelled the public man so much or so quickly as exaggeration. . . It would be idle for them to come to a conclusion on the subject; they should continue the discussion at the meeting of the International Congress in London next year. [That was the historic first ' Congress of Hygiene and Demography,' the forerunner of the present International Congresses of Microbiology.] If the subject of comparative pathology were not already entered on the programme, he would see that this was done." [It was done, and among notable veterinary contributors were Nocard, Ostertag, and McFadyean.]

Much the same as Sir Clifford Allbutt, from a corresponding position, was, successfully, later to advocate the establishment of a Chair of Animal Pathology in the University of Cambridge, Sir Henry W. Acland therefore had already anticipated the creation of a similar Chair at Oxford. We well know that the late Sir Frederick Hobday fully co-operated with Allbutt to achieve that end, in spite of well-known hosility; but Acland had not been fortunate in securing a similar liaison. And probably the time was not yet ripe—for it only became favourable after the First World War, and the issue of the report of the Prain Committee to the Development Commission in 1922 on the needs for extension of facilities for extended and improved research into diseases in animals.

As a matter purely of historic interest it is worthy of note that Joseph Goodwin (1786-1845), the first great pioneer in veterinary reform, whose signa-

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ture is appended to our 1844 Charter, decided after qualification from the London College to start practice at Oxford, where he matriculated, and endeavoured to establish a chair of comparative anatomy in the university. To that end he had already started there a course of lectures and demonstrations on the anatomy of the horse. These were suppressed by the Chancellor, as they "were found to be too erudite for the taste of the collegians." (See *The Veterinarian*, 1845, *18*, 101; and *Vet. Rec.*, 1945, *57*, 610.)

Forthcoming from the continued discussion at the B.M.A. Cambridge meeting of 1880, in which Fleming made a very able reply, the following resolution was passed: "That, in the opinion of this Section, the subject of the communicability of disease to man by animals used by him as food urgently demands careful enquiry, both in regard to the actual state of our knowledge thereon, and to the legislation which is desirable in connection therewith, and that the Committee of Council of the Association be invited to appoint a Committee for the purpose of reporting on this matter."

Then there is need to reproduce, following the above resolution, the rest of the preamble to Steel's "Report of the Origin and Progress of the [1881] Veterinary Congress" for the reader to have no doubt left in his mind as to the actual origin of the British Veterinary Association: ". . . The course of the discussions at the Public Health Section (of the 1880 B.M.A. Congress) rendered it evident that much information in the possession of the veterinary profession is not as yet accepted by our medical *confrères*. Encouragement also was derived from the fact that on the Continent in various countries gatherings of veterinarians had been recently tried on a lagre scale, and with marked success. Again, the profession in the United Kingdom had recently become consolidated by the admission of the Highland and Agricultural Society's graduates to the membership of the Royal College of Veterinary Surgeons on terms such that they availed themselves of the opportunity in very large numbers. Lastly, the proceedings at several meetings of veterinary societies had rendered it evident that some opportunity should be given of ventilating subjects of more than local professional importance, and on which the votes of a large number of members of the profession from different parts of the kingdom should be taken.

"It was accordingly resolved to make the attempt to assemble British veterinary practitioners at a Congress. . . ."

IV

The crucial error had been that whereas in the years intervening between 1867 and 1881 enormous strides had been made by the medical profession (or, at any rate, thanks to the zeal of a very few members within it), aided by statesmen and philanthropists, to establish a well-organised public health service in this country, there had not been, despite the glorious opportunity presented by the great Cattle Plague Epidemic of 1865-67, any corresponding urge within the veterinary profession to assert itself in the public service. To a large extent, this was excusable because it had not yet become clear what were the aspects

in which the profession could most usefully offer service. Thus, for example, in the paper preceding Fleming's at the 1880 B.M.A. meeting, Vacher, the Medical Officer for Birkenhead, had carefully examined what were the dangers to man from diseased animals used as food, and had brought under his review seven of the diseases then most prevalent. These were: (1) Cattle Plague; (2) "Swine Typhoid"; (3) Epizootic pleuro-pneumonia; (4) Foot-and-mouth disease; (5) "Anthrax and anthracoid diseases"; (6) Erysipelas; and (7) Tuberculosis. It sounds odd to a present-day worker to read Vacher's conclusions: "Of the seven diseases . . . but two, foot-and-mouth disease, and anthrax, can as yet be pronounced communicable to man by ingested flesh." The remaining five he "did not regard as innocuous, but merely submitted that at present their communicability remained unproved." It is not difficult to see that such conservative judgments were, at the time, well warranted.

In our issue of May last we pointed out that Edwin Chadwick's report, published in 1842, was the foundation of all complete modern sanitary work in this country. In his presidential address before the Public Medicine Section of the B.M.A. in 1880, Acland, however, recalled that when he had addressed the Association, as its President, at Oxford, *in 1868, "any complete national health organisation was still a thing of the future"* (our italics). A real beginning was not made until the establishment of the Local Government Board in 1871. Thereafter, progress was rapid. In 1872, the whole country was divided into urban and rural sanitary districts. Then in 1875 came the passing of the great Public Health Act "consolidating the sanitary laws into a simple statute, thus reducing into a methodical and complete whole provisions which hitherto had been scattered over no fewer than twenty-two separate Acts of Parliament." Then, in 1877, complete sets of model by-laws were issued, "relating to almost all the various matters which local authorities are empowered to regulate under the provisions of the sanitary law." In all this critical legislation, the veterinary profession, to its subsequent embarrassment and detriment, was "by-passed."

In the United States of America, on the other hand, the National Board of Health, which meanwhile had been established by Act of Congress, was guided by seven standing committees, one of which was, "on diseases of domestic animals." These committees were "essentially subdepartments of the common board," which united under the president for all general consultative purposes.

By 1880, there was therefore in this country a well-organised public health service covering the whole of it, with five years' experience in the working of the Act of 1875. It was therefore fitting and opportune to take under timely review that experience. Thus, opening the discussion on the "general working of the public health administration, the Medical Officer of Health for Croydon (Dr. Alfred Carpenter) declared his own opinion that *"all matters connected with public health, both of men and animals, should be entrusted to the medical officer of health, who should have control over the inspectors of nuisances . . ."* (our italics). These words express precisely the anomalous position in which for several decades the public health veterinary officer found himself, even when

the fields within which he could claim expert knowledge became well defined. Generally, in England (but not in Scotland), except where special statutory powers were obtained by a local authority, he could only exercise his special competence as " an inspector of nuisances, responsible to the medical officer of health." It cannot be gainsaid that this anomaly evoked much sympathy among several public health officers. Thus, speaking after Dr. Carpenter, the distinguished medical officer of health for Gloucester (Dr. F. T. Bond) demurred to the implication that the Contagions of Animals Act could be operated under the supervision of the medical officers of health, but he was in favour of its provisions being administered by county magistrates—a contingency which hardly presented any improvement.

We may be sure that the evidence now presented will enlighten most veterinary readers in regard to the origin of most of their difficulties in asserting themselves from the outset at a satisfactorily high level in the public services of this country.

V

Vocationally and intellectually, the papers presented at the 1881 Congress do not bear comparison with those read at the 1867 Congress. There had been no advance in those respects. It was just that the moment was more propitious for launching a national congress. However, there were two addresses presented which were of historic importance. These were: first Fleming's address describing the final stages of the passing through Parliament of the Veterinary Surgeons Bill, most valuable assistance at the last critical moment being furnished by the R.S.P.C.A. representative who attended the Congress and was much moved by what he saw and heard there. Among the distinguished medical men present who were helpful were figures of no less authority than Osler and Creighton. Secondly, though it was presented as a " minor subject," the plan submitted by the treasurer, G. A. Banham, for the continuance of the Congress as a National Association and the federation of the provincial veterinary societies under it is of historic importance. That plan had to wait for its fulfilment largely for the arrival upon the scene particularly of two figures who took a prominent part in one of those societies, namely, Bradley, as President, and Gofton, as Secretary, of the " Scottish Metropolitan," at Edinburgh.

How difficult was, however, the prospect of federation in 1881 may be appreciated if we reproduce some of the proceedings of that same society when the idea of promoting the Congress was first communicated to it.

At the Annual Meeting of the above Society held in February, 1881, the speakers present, moved largely by a young member who was also a member of the Originating Committee, Archibald Robinson, of Greenock (whose early death shortly afterwards Hunting, lamented as a loss to the profession comparable only with the early death of John Barlow), had acquiesced in supporting the Congress. At the succeeding quarterly meeting, held at Edinburgh on May 18, however, the secretary and treasurer, Professor M'Fadyean (who had been

absent from the preceding meeting) was now elected as President, and the relevant verbatim report of proceedings is as follows (*Veterinarian*, 1881, **54**, 492):—

"The *National Veterinary Congress.*

"*Mr. Rutherford* moved that, in consequence of the action taken by the Central Committee of the British National Veterinary Congress of London, in regard to members of the Highland and Agricultural Society who were practising as veterinary surgeons, they ought to withdraw from that Congress their promised support. Having alluded to their surprise occasioned by the action of the promoters of the Congress in endeavouring to make the Congress to consist solely of members of the Royal College, all others being allowed to attend merely by invitation, Mr. Rutherford characterised it as a most illiberal proceeding, and one that cast an impertinent slur on gentlemen admitted to the profession by the gate of the Highland Society. Many of them held the double qualification of the Royal College in addition to their Highland Society membership; but considering the slur to which he had alluded, any holder of a Highland Society certificate would, by countenancing the Congress, be insulting a body which gave him the means of earning his bread. (*Hear, hear.*)

"*Mr. Reekiè*, V.S., Edinburgh, seconded the motion.

"*Professor Baird* had supported the proposal in the first instance, but considering the narrow-mindedness displayed, he was now disposed to regard it in quite a different light.

"*Professor M'Fadyean thought undue importance had been given to this Congress. It was merely the conception of two or three juveniles who had exhibited an amount of prejudice and narrow-mindedness which was usually associated with ignorance.* (*Hear, hear.*) *The action of the promoters had, he believed, excited the indignation of professional men on both sides of the Border* (our italics).

"The motion was adopted. . . ."

At this date, the above passage assumes significance on at least two counts: first, it indicates precisely the consummate tact that had had to be exercised (especially in allaying the suspicions of the Scottish holders of the Highland and Agricultural Society's veterinary diploma), in order to bring to the veterinary profession the advantages secured under the 1881 Act; secondly, it also suggests the patience which at a much later date those (like the writer), whom destiny had placed near to the last speaker above mentioned after he had become a towering figure in the profession (and who persisted in discounting the enterprise as "a trade union"), had to exercise in order to bring to full maturity "*the conception of two or three juveniles*," which is the present British Veterinary Association.

[To be concluded]

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GENERAL ARTICLES

A CASE OF COLIC IN A GELDING CAUSED BY AN UNUSUAL BOWEL CONDITION

By O. V. GUNNING, D.V.M., F.R.C.V.S.

THE subject was a good quality chestnut cart gelding, nine years old.

It had been doing regular farm work since April but had been out at grass for two weeks. It had been taken out that morning, when it had fallen down and laid straight out on its side. It was therefore brought to the stable again, and later in the day professional advice was summoned.

The particulars were as follows:—

September 1

My assistants first saw the gelding that evening, when it seemed dull. The penis was protruding but no colic was noted. The temperature was 104° F., which was treated with sulphonamides.

September 2

The gelding was seen by the writer the following morning, when the symptoms were indefinite and baffling. The temperature had dropped to 102° F. When standing in the yard for examination he was noted to stand with his forelegs crossed, suggesting a brain condition, but he failed to show this symptom again. There was once a slight crouching suggesting abdominal pain, and when he was returned to his stall he lay down. Rectal examination revealed hard fæces, and at the extreme length of the arm and finger-tips something doughy could be palpated; otherwise there was nothing to assist in diagnosis. An enema was given and the stomach tube passed and two gallons of solution given containing 8 oz. sodium chloride and 2 drachms of formalin.

6.30 p.m.—Seen again the same evening, the animal still showed subacute pain. Convinced that constipation was at least part of the trouble, strychnine sulphate gr. ss. and carbamylcholine were given hypodermically.

September 3

The horse appeared better; the strychnine hypodermically was repeated. The bowels had acted but were still on the hard side.

6.30 p.m.—The gelding had eaten a small bran mash and some hay, was definitely better, and the case was looked upon as closed.

9.30 p.m.—A 'phone call that the horse was again uneasy. Examination showed a flare-up of the subacute pain. Temperature 102.7° F., pulse 48—no further bowel movement. Decided that chronic constipation was still present, and repeated the sodium chloride and formalin by tube. This increased the pain more than anticipated, and he showed pain throughout the night.

September 4

7.30 a.m.—The animal was in pain on my arrival but almost immediately became easier. At this time the temperature was 101° F., pulse 50, respiration

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16. The eye showed but a slight muddy icteric hue. Taken to the trough, the gelding well washed out his mouth, took a few swallows of water, and was anxious to pick a little hay. A 'phone call was received during the day stating the horse had had a really good motion and was much better.

September 5

Gelding much better, so left well alone. Crossed off books.

September 15

A further call came that the horse was again in pain. During this interval of ten days, the animal had been attended by the head stockman, a most conscientious man. In spite of a regulated diet, the fæces were still hard and unduly dry, and the attacks of pain were becoming more acute. Earlier suspicions were, therefore, strengthened that something more than a simple constipation was the underlying cause. Antispasmodics, chloral, and mineral oil were substituted for the saline, and a small dose of carbamylcholine given hypodermically.

September 16

Animal easier, active peristalsis both sides. Fæces still too hard. Oil given.

September 17

3.30 a.m.—Urgent call that the horse was unmanageable. The pain was violent, so much so that the animal had smashed the front out of his loose box. Atropine gr. $\frac{3}{4}$ gave spectacular relief.

10.30 a.m.—Pain returned; atropine again gave relief. As soon as relief was given, unlike a twist, the pulse returned to 48, and the respirations became regular. The eye was not unduly injected; the coat remained bright; and the animal, in spite of a protracted illness, had not lost weight unduly. At this stage a V-shaped coil of bowel could be palpated, pushing back into the pelvic cavity, and a definite diagnosis of bowel displacement could be confidently given and destruction advised. This was fortunate, as on my arrival the horse looked hopeless, with patchy sweats, laboured catchy breathing, and a pulse of 60 to 80.

Post-mortem Examination, 2.30 p.m.—On opening the abdomen with the horse lying on its back, a coil of small intestines was noticed lying above the large. The large bowel also showed a sort of double kink at the pelvic flexure. These were, however, probably secondary manifestations.

At a point about a hand's-breadth dorsal to the xiphoid cartilage on the right side and under cover of the last two ribs, two loops of the small intestine were found adherent to the abdominal wall. The affected portion, which involved three yards of bowel, was at a position (measuring along the bowel) approximately fourteen yards from the stomach and six yards from the ileo-cæcal valve. The adherent mass was dissected from the abdominal wall and found to contain an abscess containing about a pint of stinking pus. The abscess was found to connect by a sinus with the more proximal loop of bowel.

One presumed that it was the result of penetration by some sharp body at probably some distant date.

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With the exception of the region of the omentum adherent to the abscess, there was a striking absence of inflammation throughout the viscera as invariably seen in torsion or twist.

Acknowledgments

The writer is indebted to his assistants, Messrs. D. Heatley, M.R.C.V.S., and C. D. Cooke, M.R.C.V.S., for their assistance and interest in the case.

THE LYMPH NODES OF THE GUINEA-PIG

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Introduction

THE guinea-pig, *Cavia procellus L. cabayo*, is one of our laboratory animals most frequently used. Since there is no description of its lymph nodes in English, and descriptions in other languages — mostly in German — are incomplete, it seemed worth while to undertake the present work.

In its anatomy, the guinea-pig most closely resembles the white rat. The lymph nodes are often embedded in multilocular adipose tissue, which makes them difficult to find; the majority are reasonably constant in position — this is particularly true of glands of significance to the pathologist.

Literature

A well-known description of part of the lymphatic system of the guinea-pig was published by Schauder (1923)[1]. He describes the lymph nodes of pathological importance, enumerating the "flesh" and "organ" lymph nodes.

Jaffe, in his book (1931)[2], describes the presence of the subiliac and axillary nodes, also the "Peyer's patches" (iliocæcal lymph node), the nodules at the bifurcation of the trachea and mental nodes are mentioned. In his second work (1933)[3], the developing lymph nodes of a 9 mm. (c-r. length) guinea-pig embryo are described and the full histological description given.

1 and 3: referred after Winkelmann.

H. Winkelmann (1937)[4] is the first author to give a comprehensive description of the lymph nodes of the guinea-pig, with the exception of the gastric group.

Keller (1937)[5] published a work on the lymph vessels of the skin, and Falke (1939)[6] described the lymph vessels of the digestive tract. Winkelmann refers to Sakomato's (1934)[7] description of a newly-detected anal lymph gland which no one has been able to demonstrate since.

Material and Technique

In this investigation, thirty guinea-pigs between the ages of four and six months and having an average body weight of 500 gr. were examined within

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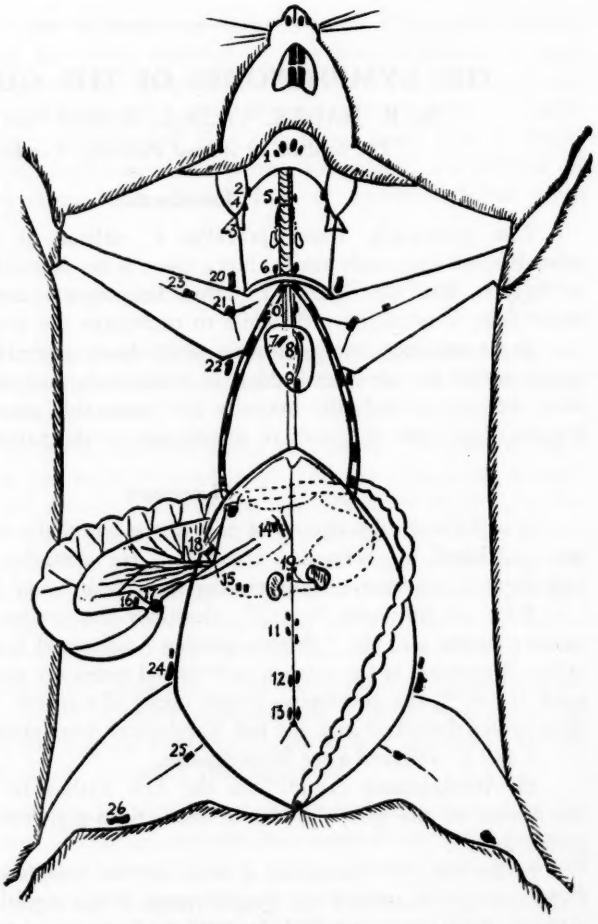
one hour after death. Of the thirty, sixteen were males and fourteen females. Some of them were non-reactors which had been used for milk testing. Some were examined without using any special method to mark the lymph glands. Others were stained intravitally by the method used by Cappel (1929)[8] and Sanders (1940)[9]. Attempts were made to stain regional lymph nodes by the supravital method, described by Baum (1928)[10]. This last method needs much



The Lymph Nodes of the Guinea Pig.

1. Sub-mental lymph node.
2. Mandibular lymph node.
3. Retropharyngeal lymph node.
4. Parotideal lymph node.
5. Cr. lnn. of the cervix.
6. Caud. lnn. of the cervix.
7. Bronchial lymph node.
8. Cr. mediastinal lymph node.
9. Dorsal mediastinal lymph node.
10. Sternal lymph nodes.
11. Lumbal-aortical lymph nodes.
12. Iliac lymph nodes.
13. Sacral hypogastrical lymph nodes.
14. Hepatic-portal lymph nodes.
15. Gastric lymph node.
16. Ileal lymph node.
17. Ileo-caecal lymph node.
18. Mesocolic lymph nodes.
19. Renal lymph nodes.
20. Prescapular lymph node.
21. Axillary lymph node.
22. Accessory axillary lymph node.
23. Cubital lymph node.
24. Subiliac lymph node.
25. Deep inguinal lymph node.
26. Popliteal lymph node.

skill and practice, and it is much more difficult to obtain a satisfactory result than by any of the intravital staining methods. The Magnus (1922)[11] method was also tried in searching for a suitable technique, but it was found to be impractical and was discontinued. Sometimes minute lymph nodes were found in glands or other situations where they are not always present. Such deviations from the normal will not be mentioned in this paper.

Description

The lymph nodes of the guinea-pig are grouped according to the customary anatomical method, i.e. :—

(a) The lymph nodes of the head and neck;
(b) The lymph nodes of the thoracic cavity;
(c) The lymph nodes of the abdominal and pelvic cavity—
  (i) parietal group, and
  (ii) visceral group;
(d) The lymph nodes of the thoracic limb; and
(e) The lymph nodes of the pelvic limb.

(A) The lymph nodes of the head and neck are :—

(1) The buccal lymph node;
(2) The sub-mental lymph nodes;
(3) The mandibular lymph node;
(4) The parotideal lymph node;
(5) The retropyaryngeal lymph node;
(6) The cranial lymph nodes of the cervix; and
(7) The caudal lymph nodes of the cervix.

(1) *The buccal lymph node*

This lies under the skin and the very thin fascia, under the m. nasolabialis, 2 to 3 mm. beneath the zygomatic arch, but immediately anterior to the caudal border of the m. masseter.

(2) *The sub-mental lymph nodes*

This group consists usually of two to four lymph nodes and is always present. When all four are present, the medial pair is larger than the lateral. They lie under the skin embedded in the fascia, about 2 cm. distant from the symphysis mandibularis in the midline. Lateral to them is the transition between the tendon of origin and the fleshy part of the anterior belly of the m. digastricus.

(3) *The mandibular lymph node*

This is constant and situated laterally to the cranial point of the parotid gland, very near to where the external maxillary vein joins the sub-mental vein, and lies under the platysma. It is about 3 mm. long.

(4) *The parotid lymph node*

This lies under the anterior lobule of the parotid gland ventromedially to the cranial border of the annular cartilage of the ear. It is about 2 mm. long and not always present.

(5) *The retropharyngeal lymph node*

This is found under the dorso-caudal border of the parotid gland, sometimes wholly and sometimes partly covered by it. I often found more than one. It measures about 2 mm. in length.

(6) *The cranial cervical lymph nodes*

This group consists usually of four lymph nodes, one-one pair of them on both sides, stretching from the anterior part of the thyroid gland down to the

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thymus. Their number is not fixed, but generally there are four of them and they usually lie on both sides of the trachea. They are constant and not greater than 1 to 2 mm. in length.

(7) *The caudal cervical lymph nodes*

They are the caudal members of the previous group. They are encountered from a horizontal line, drawn across the caudal end of the thymus down to the opening of the thorax. They lie medial to the jugular fossa. There are usually four, one-one pair, and are nearly always parallel on both sides. They are constant and never measure more than 2 mm. in length.

Previous authors used to divide groups 6 and 7 into three: the deep cranial cervical, the deep medial cervical, and the deep caudal cervical. In addition, the præscapular lymph node was referred to as the superficial cervical. This latter node is situated on the anterior border of the thoracic limb. It receives lymph vessels from the superficial regions of the head and neck as well as vessels from the thoracic limb. But, since the cervical groups referred to all drain deep regions of the neck, it seems preferable to consider the præscapular with the lymph nodes of the thoracic limb.

The previous division of the cervical nodes into three groups would appear unnecessary. There is a constant anatomical division into two groups only—cranial and caudal. The individual drainage area of parts of the cervical group has not yet been distinguished, and so it would seem preferable to keep their description as simple as possible.

(B) The lymph nodes of the thoracic cavity are:—

(1) The bronchial lymph nodes;
(2) The cranial mediastinal lymph node;
(3) The dorsal mediastinal lymph nodes; and
(4) The sternal lymph nodes.

(1) *The bronchial lymph nodes*

These were found on both sides of the bifurcation of the trachea, usually one on each side of the bronchus. They are generally no larger than 2 mm. and are constant.

(2) *The cranial mediastinal lymph node*

This is found on each side of the vena costocervicalis. It is usually single, but occasionally there are more than one. The node is generally about 4 mm. in length and is constantly present.

(3) *The dorsal mediastinal lymph nodes*

These lie on the dorsal surface of the aorta, close to the diaphragm. Their number varies from two to three. They are constant and about 2 mm. in length.

(4) *The sternal lymph nodes* (*thoracic lymph nodes*)

These small nodes lie quite close to the thorax on the first sternebra. In some cases I was not able to detect them, although they are generally considered to be constant. They are about 2 mm. long, when present.

Having regard to the position and drainage area of the "costocervical"

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lymph node of Winkelmann, it seems advisable to use the term "cranial mediastinal lymph node" first employed by Falke.

(C) The lymph nodes of the abdominal and pelvic cavity are:—

(i) Parietal group—

(1) The lumbar-aortical lymph nodes;
(2) The iliac lymph nodes; and
(3) The sacral hypogastrical lymph nodes;

(ii) Visceral group—

(1) The hepatic-portal lymph nodes;
(2) The gastric lymph node;
(3) The pancreatical-duodenal lymph nodes;
(4) The splenic lymph node;
(5) The cranial mesenteric lymph nodes;
(6) The ileal lymph node;
(7) The ileocæcal lymph node;
(8) The mesocolic lymph nodes;
(9) The caudal mesenteric lymph nodes;
(10) The renal lymph nodes; and
(11) The superficial inguinal lymph nodes.

(i) (1) *The lumbar-aortical lymph nodes*

They lie along the course of the lumbar part of the aorta abdominalis and the posterior vena cava under the lumbar vertebræ. They are always present but their situation is not constant. They are four in number and never longer than 2 mm.

(i) (2) *The iliac lymph nodes*

Generally there are two on each side of the aorta abdominalis, anterior to the bifurcation to the external iliac arteries. They are never longer than 2 mm. and are constantly present.

(i) (3) *The sacral-hypogastrical lymph nodes*

They are found at the division of the abdominal aorta into the two hypogastric arteries. They are usually two in number and are covered by the rectum and urogenital apparatus. Their length is about 3 mm. and they are constant.

(ii) (1) *The hepatic-portal lymph nodes*

These occur in the hepato-pancreatic ligament, usually two in number and are about 2 mm. in length.

(ii) (2) *The gastric lymph node*

This is situated on the dorsal surface of the pylorus and is about 2 mm. in length.

(ii) (3) *The pancreatical-duodenal lymph nodes*

These consist usually of two small lymph nodes in the gastro-pancreatic ligament.

(ii) (4) *The splenic lymph node*

This is found in the gastrosplenic omentum. It is small and usually single.

(ii) (5) *The cranial mesenteric lymph nodes*

These are situated in the cranial part of the great omentum and consist of three or four lymph nodes of various sizes (5 to 10 mm.).

(ii) (6) *The ileal lymph node*

This node is found in the fold between the ileum and cæcum, quite close to the ileocæcal lymph node. It is single and about 3 mm. in length.

(ii) (7) *The ileocæcal lymph node*

The node lies on the head of the cæcum at the ileocæcal junction. It is about 3 to 6 mm. long.

(ii) (8) *The mesocolic lymph nodes*

These are embedded in the fatty tissue of the mesentery which suspends the inner curvature of the descending colon and consist of one to three lymph nodes up to 3 mm. in length.

(ii) (9) *The caudal mesenteric lymph nodes*

These are found in the mesentery of the descending colon. They consist of a few quite small lymph nodes about 1 mm. in length.

(ii) (10) *The renal lymph nodes*

These are constant in position and are about 1 mm. in length. They lie under the renal artery and vein.

(ii) (11) *The superficial inguinal lymph nodes*

These are inconstant nodules which lie on the ventral surface of the os pubis, between the mammæ, preputium and the abdominal wall. These, when present, are about 2 mm. in length.

(D) The lymph nodes of the thoracic limb are:—

(1) The præscapular lymph node;
(2) The axillary lymph node;
(3) The accessory axillary lymph node; and
(4) The cubital lymph node.

(1) *The præscapular lymph node*

This is generally embedded in adipose tissue quite close to the shoulder joint and is found on the anterior surface of the m. supraspinatus. It is constant and is 4 to 5 mm. long.

(2) *The axillary lymph node*

This is situated in the medial surface on the upper arm. After removal of the m. serratus ventralis, it is seen on the medial surface of the m. teres major, in the fork formed by the thoracicodorsal artery and vein and the subscapular artery and vein. It is always present and is about 4 to 5 mm. in length.

(3) *The accessory axillary lymph node*

This is always present and is situated on the posterior border of the scapula between the m. deltoideus and the long head of the m. triceps, just posterior to the m. infraspinatus.

(4) *The cubital lymph node*

This lies on the medial side of the forearm, between the m. biceps brachii and the medial head of the m. biceps on the middle brachial vein.

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(E) The lymph nodes of the pelvic limb are:—

(1) The subiliac lymph nodes;

(2) The deep inguinal lymph node;

(3) The femoral lymph node; and

(4) The popliteal lymph node.

(1) *The subiliac lymph nodes*

There are generally two, very often three, lymph nodes, about 3 to 5 mm. in length. They are found in the flank on the anterior border of the m. tensor fasciæ latæ. They are constant, embedded in fatty tissue and can be palpated in the living animal.

(2) *The deep inguinal lymph node*

It is found when present within the pelvic opening of the femoral canal between the anterior border of the m. gracilis and the posterior border of the m. sartorius, on the point where the ext. iliac artery becomes femoral artery. It is constantly present and is some 2 to 3 mm. long.

(3) *The femoral lymph node*

This is one of the smallest lymph nodes. It is always found in the neighbourhood of the ext. saphenous vein where the saphena artery passes to the medial side of the thigh. It is about 1 mm. long.

(4) *The popliteal lymph node*

This is found on the lateral side of the thigh between the m. biceps femoris and m. semitendinosus. It is 2 to 3 mm. long and is constant.

Acknowledgments

Herewith I gratefully acknowledge the help of Mr. R. Green and Mr. A. O. Betts.

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STUDIES ON THE BLOOD OF DOGS:

VIII. — General Summary. The Blood Picture as a Diagnostic and Prognostic Guide in Diseases of the Dog.

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WITHIN recent years, recourse to hæmatology has been sought by relatively few veterinary workers as an aid to the diagnosis and prognosis of animal diseases. The reason for the reluctance of veterinary workers to engage upon this study probably resides in part in the need for much experience in undertaking the work to arrive at reliable data, and in part also in the difficulty of interpreting the data when they have been collected. Examination of the blood can, however, be of great value to the Veterinarian. In general, it provides an indication of the degree and manner of response of hæmopoietic tissue to an infectious or other morbid agent. Systematic examination will therefore often help to clarify the nature of the actual morbid agent in a given clinical case as well as suggest valuable evidence in regard to either deterioration in resistance or progress towards recovery.

Red Cell Count and Hæmoglobin Estimation

It must be pointed out that most of the Egyptian dogs used in these studies suffered from malnutrition and from intestinal helminthiasis, which, however, is dealt with under a separate heading. Hence, some anæmia was noticed in normal and apparently normal animals, and in general, the normal average of cell count and hæmoglobin amount were slightly below those recorded in similar studies in other countries.

Systematic blood studies are seen to be essential for the accurate diagnosis of anæmia and of equal importance in indicating the type of therapy to be administered in those affections in which anæmia is predominant as well as in measuring its efficacy.

Variation in the red cell count may be due to physiological or pathological causes. Erythrocytosis occurs through stimulation of the erythropoietic tissues, principally, as is well known, but not entirely, the red bone marrow. It has been observed in the later stages of pregnancy, and is then mainly due to loss of fluid from the body (anhydræmia) causing concentration of corpuscles or relative polycythæmia. It was also met with in chronic babesiasis.

Oligocythæmia, or simple deficiency of red cells, is observed in several physiological states, the chief of which are early pregnancy and parturition. It also occurs in puppies. Pathological anæmia, in which there is diminution of red cells and decrease in hæmoglobin, and is often accompanied by the presence of abnormal red cells in the peripheral circulation, occurred in the majority of the affections met with in this study. It reached its maximum in acute babesiasis, distemper and grave cases of pneumonia. The red cell loss and its normal

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sequel, regeneration, can be recognised by the alteration in shape, size, staining reaction and nucleation of the red cells. Generally speaking, it may be said that changes in shape, size, and staining reactions indicate the reaction of the red marrow to red cell destruction. Marked variation in the size (anisocytosis) of the red cells is usually associated with alteration in shape (poikilocytosis). These changes are found in any form of anæmia. Pallid cells with a large and colourless central area are suggestive of a considerable degree of anæmia.

In the adult, the normal circulating red cells are non-nucleated; in the various anæmias, nucleated red cells and reticulocytes were slightly or much increased in the peripheral blood. The reticulocyte count is of some value in differential diagnosis; an increased count indicates an increased rate of blood destruction. Reticulocytes are normally or physiologically increased in puppies, and in the adult during pregnancy and parturition. They are much increased in cases of acute babesiasis, pneumonia and distemper. Their abundance varies with the severity of the anæmia, being least evident in milder anæmias. They are within normal range or absent in cases of intestinal helminthiasis, mange and chronic babesiasis. The reticulocyte count furnishes an accurate index of red cell regeneration; it may thus be utilised as a measure of therapeutic response.

On the whole, absence of red cell changes denotes absence of any severe form of anæmia.

Total Leucocyte Count

An estimation of the total white cell count will give general information upon the presence of infection. Another purpose of a leucocyte count is to determine whether there is an increase or decrease from the normal range of any of the various types of leucocytes present in the circulating blood. Infectious stimuli necessitate the entrance of leucocytes into the blood stream in response to them, and both leucocytosis and leucopenia are therefore manifestations of reaction to such stimuli. The degree of either leucocytosis or leucopenia depends upon the nature and intensity of the stimulus and the ability of the patient to respond to it.

Puppies and young dogs have a normally low leucocyte count. Physiologically, leucocytosis is recorded in cases of pregnancy in females, while it is pathologically recorded in teeth affections and mild cases of pneumonia.

Differential Count

This count gives an approximate idea of the relative proportion of the various cells. The varieties of leucocytes in health are fairly constant both in absolute numbers and relative proportions.

When an increase of white cells occurs, it usually affects one type of cells more than any of the other types. Although there are physiological variations, yet there are definite factors which stimulate an increased production of one type of cells instead of others. The red marrow and the lymphoid system can be regarded as tissues which respond to a variety of stimuli by passing out more or

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less mature cells into the circulation. The extent and nature of the transference vary directly with the extent of the stimulus.

The majority of acute inflammations are due to cocci-pyogenic organisms which act as a specific stimulus for the neutrophile leucocytes. On the other hand bacillary infections appear to stimulate the lymphatic machanism. Protozoal infections on the other hand cause an increase of the monocytes whereas helminthic infections and skin diseases produce an eosinophilic reaction. A combination of factors, however, may distort the blood picture and give rise to various reactions; so we may find a neutrophilia in helminthic infestation when secondary pyogenic infection is superadded to the original affection. We thus find that differentiation of the white cells into neutrophiles, eosinophiles, lymphocytes and monocytes will undoubtedly attract our attention to a special disease.

Neutrophiles

The neutrophiles commonly comprise about 67 per cent of the total number of white cells in adult dogs. In puppies, the lymphocytes have the highest number and percentage.

Neutrophilia is known to be an accompaniment of normal digestion. Physiological neutrophilia also occurs in the later stages of pregnancy and in animals with a diet composed chiefly of meat. In the early stages of inflammation the neutrophiles are absolutely and relatively increased, the increase measuring the relation of the severity of infection to the resisting power of the individual. This is emphasised in the discussion on pneumonia. Among the diseases that are characterised by a marked pathologic neutrophilia are cases of babesiasis, pneumonia, distemper and teeth affections.

Neutropenia on the other hand, occurs physiologically in puppies and during the early period of pregnancy and pathologically in a variety of conditions, for example, *Spirocerca sanguinolenta* infestation, skin diseases, intestinal helminthiasis, spleen infarction and *Hepatozoon canis* infection.

Eosinophiles

Eosinophilia was observed in helminthiasis, certain skin diseases, cases of *Spirocerca sanguinolenta* and *Hepatozoon canis* infection and Spleen infarction.

Eosinopenia was observed in the early stages of inflammation, as in pneumonia, babesiasis and teeth affections.

In severe inflammations and infections of pyogenic origin, the eosinophiles disappear when neutrophilic leucocytosis occurs. The eosinophiles reappear in the peripheral blood when the cause of inflammation or infection is overcome. Their appearance is considered of a great prognostic importance as it points to the fact that the animal is well on the way to recovery.

Until recently the presence of an unusually large number of eosinophiles in the blood was considered to be almost diagnostic of a severe infestation with external or internal parasites, while on the other hand an absence of eosinophilia was held to present very strong evidence that the animal was almost, if not entirely, free from parasitic invasion.

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During the last few years, however, our knowledge regarding the relationship between parasitic infestation and an eosinophilia has been undergoing a considerable change. Eosinophiles are quite consistently increased in infestation with various intestinal parasites; thus, infestation with various tapeworms, round worms, or both, cause a varying degree of eosinophilia.

There was a marked relative as well as an absolute increase in the number of eosinophiles in the blood of dogs with a mild parasitic infestation, and a moderate increase in those showing heavy infestation. This eosinophilia attained its maximum average in dogs infested with the nematodes, and in these cases the lymphocytes were greatly decreased. Conversely, eosinophilia attained its maximum average and lymphocytes their maximum average in dogs infested with cestodes.

It would thus appear that the degree of eosinophilia gives no indication as to the intensity of the parasitism in dogs, though it may provide some indication of its chronicity.

Basophiles

Increase of basophiles occurred rarely. It was met with in cases of spleen infarctions, cestode infestation, mild pneumonia and eczema. The basophiles are totally absent in cases of acute babesiasis, *Hepatozoon canis* infection, grave pneumonia and distemper.

Increase or decrease of basophiles in the circulating blood is not known to be of any significance; the importance of these cells is not yet understood.

Lymphocytes

Physiological lymphocytosis occurs in puppies, during gestation and after parturition. In disease, the condition was met with in some helminthic affections such as cestode infestation.

Lymphopenia was recorded in severe pneumonia, distemper, chronic babesiasis and eczema.

Monocytes

Monocytosis was found in skin diseases, distemper and during the early period of pregnancy.

Schilling Index

The stimulus of infection produces leucocytosis in the peripheral blood and so immature neutrophiles appear in proportion to the intensity and urgency of demand. We preferred to use the Schilling classification because it affords the most valuable indication as to the degree of immaturity of the neutrophiles and hence the degree of bone-marrow stimulation. This classification was applied in all the cases studied. Myelocytes and other young forms were increased in cases of pneumonia and distemper, acute babesiasis and *Hepatozoon canis* infection.

In general, the degee of immaturity is an indicator of the severity of bone marrow stimulation, but it does not necessarily follow that the degree of

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immaturity is equivalent to the severity of a given infectious process. When the degree of cellular immaturity is marked, this is usually referred to as "a shift to the left."

Acknowledgment

I would like to record a sense of my deep gratitude to Professor El Sayed Fuad, M.V.Sc., F.R.C.V.S., Professor of Pathology, and now Dean, School of Veterinary Medicine, Fuad 1. University, for his interest and encouragement in the course of the work executed in these studies which was concluded in 1942 and embodied in thesis presented to the Fouad I University, Cairo, for the degree of M.V.Sc.

During his period of office as Honorary Dean of the Faculty in 1947, Dr. J. T. Edwards encouraged me to submit the more essential parts of the Thesis for publication, and throughout he has guided me closely in the manner of presentation.

The numerous histograms and graphs accompanying each section in the original have not been published for lack of space.

UNVEILING OF THE PORTRAIT OF THE LATE DR. F. BULLOCK, REGISTRAR R.C.V.S., 1904-46

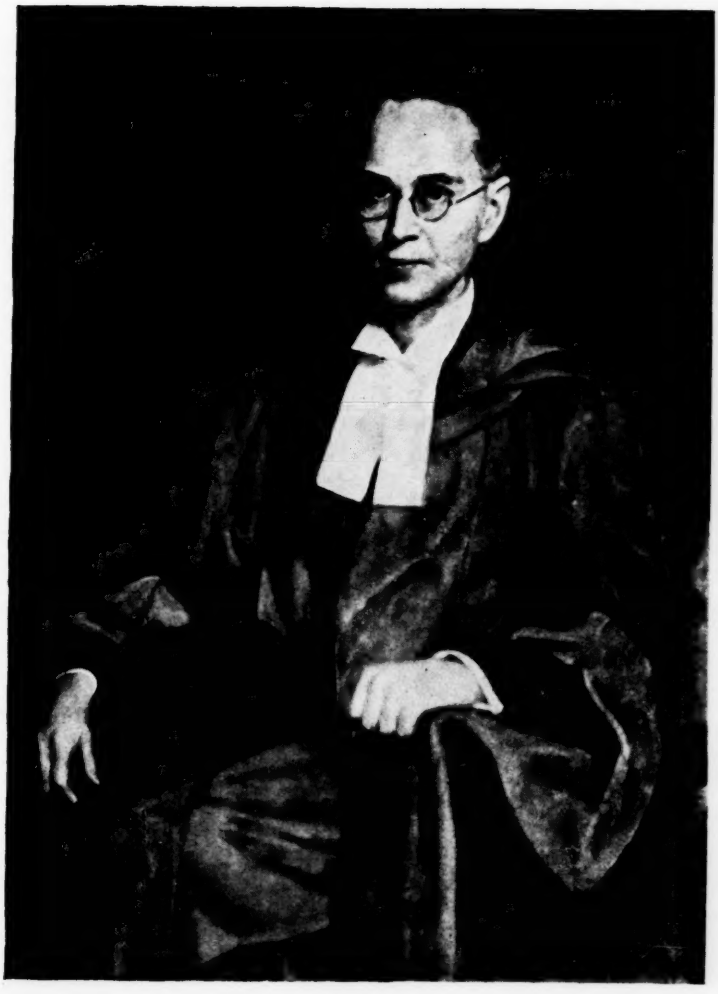
MEMBERS of Council of the Royal College of Veterinary Surgeons and guests met on October 12, 1951, to receive into the custody of the Royal College of Veterinary Surgeons a posthumous portrait of Dr. Bullock, Registrar from 1904 until 1946, painted by Mr. A. Mason, R.A.

The President of the Royal College (Professor J. G. Wright, M.V.Sc., F.R.C.V.S.), said: "We are assembled this morning to receive into the custody of this Royal College a posthumous portrait in oils of Dr. Fred Bullock, late Secretary and Registrar of the College. This portrait is the outcome of public subscription which was initiated by a colleague during the Presidency of Mr. Howard Dawes, and Mr. Arnold Mason, R.A., was entrusted with the task. We are most happy to have with us this morning Mrs. Bullock; their son, Mr. Wilfred Bullock; and a further generation, Wilfred Bullock."

(*The portrait was then unveiled.*)

The President continued:—

"Dr. Bullock was a Staffordshire man. After his boyhood education at home he proceeded to the University of Caen in Normandy, where he acquired a great love for French literature and for the French language. He returned to England and became an educationalist in his native county of Staffordshire. In 1907 at the age of 28 he was appointed the Secretary and Registrar of this Royal College, and he continued to serve it in that capacity for forty years, a



FRED. BULLOCK, LL.D.,
Registrar, Royal College of Veterinary Surgeons, 1904-1946.

period of great loyalty and great devotion to our interests. He brought wisdom to our counsels, and by the very great honour and distinction which he, as a man, attained, we were able to bask in the reflected light which came from his distinction.

"He was a man of great mental capacity, and he was a man of great energy. His duties at this Royal College were not sufficient to fill that great mind, for he was a scholar seeking knowledge. We find that in 1930 he prepared a treatise on one of the French West African Colonies, the Ivory Coast. By his researches into original documents he was able to show that the general views held in France regarding the origin of that colony were in fact wrong.

"In 1923 we find him a student of law in the University of London and reading for the Bar. In 1926 he obtained the degree of Bachelor of Law of the University of London, and in the same year he was called to the Bar at Gray's Inn. But not being content he now makes legal affairs the object of his researches, for two years later he presents a thesis on the law relating to the practice of medicine, dental surgery, and veterinary surgery. For this he became a Doctor of Law of the University of London. I think that that work was his *magnum opus* but he continued with many other writings.

"About this time, many of you will recall, he became associated with the late Sir Frederick Smith, who had taken upon himself the colossal task of searching the archives in the preparation of his history of veterinary literature. In this matter Dr. Bullock was a great and constant help to him. It was he who was largely responsible for searching of the continental archives.

"It is appropriate at this point that I should say that he was fortunate in his intellectual pursuits in having the great help of his wife, Mrs. Bullock, for she also is a scholar of distinction.

"Dr. Bullock was a linguist. He had a deep knowledge of Latin. He was fluent in French and German, and in fact there were few European languages around which he could not find his way. Some in this room will remember the 1930 International Veterinary Congress, of which Dr. Bullock was the General Secretary. You will recall the great delight which he gave the French delegates when he addressed them fluently in their own language.

"Not only was Dr. Bullock a man of great intellect; he was also a very kindly and sensitive creature. There are few in this room who have not received kindness from the hand of Dr. Bullock at some stage in their lives. Particularly was he kind to young men. Dr. Bullock was able to understand the hopes and the fears of young men, for he was a young man in mind throughout his life. That is the manner of the man whom we are honouring this morning.

"In 1939 Dr. Bullock was 62 years of age. It was reasonable and proper

to expect that he might now relax a little, that he might take a little leisure to bask in the sunshine of his scholarship and attainment. But that was not to be. There came the war and with it the tremendous upheavals which war entailed. He had the enormous task of evacuating the College to Harrogate. His home was uprooted and the finding of alternative accommodation was extremely difficult. Staffing problems became greater and greater, and his College demands became more and more onerous. The conduct of our examinations became increasingly difficult. We were at this time meeting the impact of the Loveday Report, which gave Dr. Bullock an enormous amount of work. He had to do with his own hands many of the things which ordinarily he could have deputed to his clerks.

"Shortly after the return of the College to London he died. Of no man could it be more truly said that he died in harness. At the time of his death he was shouldering a burden which might have caused a stronger man to stagger and to fall. Mrs. Bullock, Mr. Wilfred Bullock, we are happy and sincerely privileged that this portrait should hang in this Royal College which he served so well and so long. The fact that it hangs on the wall of the room in which, for long periods, he worked will be to you a source of joy and pride.

"We are privileged also to have here the artist, Mr. Arnold Mason. Sir, none of us would presume to be art critics, but we think we are able to appreciate an object of great artistic merit when we see it, and that is how we regard this picture. I understand that you did not know Dr. Bullock in life. I can assure you that by your skill and talent you have produced for us an image which is life-like. It is to us an object of great pleasure and deep satisfaction.

"The memory of Fred Bullock will always live as long as this Royal College lives, but the presence of this portrait will make that memory ever more real and more vivid."

Mr. Wilfred Bullock said: "My mother has asked me to speak for her this morning because she feels it extremely difficult to bring herself to speak at all. She, more than anyone, has never been able to get over the great loss which she feels, and it would be extremely affecting for her to try to thank the College and the President for the very kind words which he has said this morning.

"It would be presumptuous of me to attempt to express in words what we feel. I know that my father would have expressed himself far better than I can hope to do, but I should like to say that this enduring memorial which will hang on these walls of the Royal College which for forty years was his life, is something which affects us very much. We are, as a family, extremely proud. I have to-day brought my elder son to see this portrait, and when we are in London we shall come and look at it with pride and think with affection of the Royal College which has made this possible."

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ABSTRACTS

ARTIFICIAL INSEMINATION BY THE INTRAPERITONEAL ROUTE, by G. C. Van Drimmelen (1951). A study in sex physiology of pigeons and fowls with reports upon a modified technique of semen collection, and a new technique of insemination, and observations on the spermatozoa in the genital organs of the fowl hen. From *Ondersteport Jl. Vet. Res.*, Supplement No. 1 (May, 1951).

THE first part of this monograph presents a comprehensive review of the literature dealing with artificial insemination in birds, and with the migration and viability of spermatozoa stored in the body of the hen. The author describes his development of a satisfactory abdominal massage technique for semen collection from both pigeon and fowl cocks whereby an operator can work satisfactorily single-handed. A method for the fertilisation of pigeon and fowl eggs by the intraperitoneal injection of semen in the ovarian region is described. The technique of injection, including the site and instruments used, is dealt with fully. The results of an extensive series of inseminations by this route are set out in detail. Adequate control experiments were carried out alongside the intraperitoneal inseminations, and it was found that this new method gave a fertility rate that was measurably higher than after artificial inseminations *per cloacam*, whilst at the same time not comparing unfavourably with natural inseminations.

Comprehensive data is included on the effect of intraperitoneal inseminations on such important aspects as egg production, health of the birds, the onset of, and length of fertility, and hatchability of the eggs. The effect of the breed and age of the birds, and the instruments used, were also considered.

In vitro methods for estimating the fertility of semen are described, including the effects of storage and dilution on semen, as indicated by the author's own experimental work. An interesting study on the possible site of storage of spermatozoa in the body of the hen revealed that the lumen of the infundibulum of the oviduct was the only locality from which spermatozoa in a progressively motile state could be demonstrated during the period of three to 14 days after insemination. The existence of "sperm-nests," i.e., concentrations of spermatozoa in the mucosa of the chalaziferous region of the infundibulum was confirmed; the significance of this finding is discussed, and it is concluded that this finding supplies an acceptable explanation for the phenomenon of the long duration of fertility in the fowl hen after separation from the male. D.W.B.S.

NEW METHODS OF TREATMENT IN NON-CONTAGIOUS DISEASES IN LARGE ANIMALS, by Professor P. A. Oganesyan, The Erevan Zoo-veterinary Institute. From *Veterinaria*, No. 5, May, 1951.

THIS paper contains a number of points of very considerable interest, and the strongly practical bias which appears to characterise the work done at the Erevan Institute is at once stimulating and refreshing. Apart from its scientific

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value, the article has the additional merit of showing that the Russian and the English veterinary surgeon are bound together by strong ties of human frailty: both make mistakes, neither possess by any means a sound knowledge of the complicated workings of the digestive apparatus of the ruminant. In both countries, it appears that ignorance of the normal physiological processes results in a large number of perfectly healthy animals being "treated" annually for imaginary gastro-intestinal disorders, and treated moreover by the exhibition of drugs which have been in use time out of mind and which time out of mind have exerted no effect at all on the alimentary tract. The paper also lays stress on the fact which we have all noted from time to time, that the two main characteristics of pharmacological textbooks are optimism and extreme caution, both indeed admirable qualities but which when harnessed to medicine have been responsible for so many of the monuments which we see in our country churchyards.

The experiments carried out at the Institute were all performed on mature animals; calves were avoided on the ground that their digestive systems were not developed completely. Fistulæ were made into the rumen, reticulum, and omasum of the majority of the animals, and in the case of the rumen were often large enough to admit the complete hand and arm of the investigator; rubber sounds were also introduced in order to measure the force and frequency of the peristaltic contractions.

Three main facts were established by these manipulations: firstly, that antiperistaltic contractions of the rumen were always accompanied by belching and that these eructations took place at the rate of four or six every five minutes. This is in sharp contra-distinction to the teaching of many of the textbooks, which lays down that a lower frequency than twelve to the five-minute period is to be regarded as pathological. Secondly, it was discovered that the force and frequency of the peristaltic and antiperistaltic movements were not the same in all animals but varied with the age and sex of the animals, the state of the nervous system, and the type and quantity of the food. The third fact which emerged was that during the peristaltic contractions of the rumen the omasum was at rest; during the antiperistaltic movements, however, the latter organ took on movements of deglutition. From the latter fact it was deduced that in disorders of the fore-stomachs it was of importance to administer medicines capable of increasing the contractile powers of these organs in order to open the omasum and secure the passage of food into the alimentary tract.

It was also established that a chewed bolus of hay and oil cake takes seven seconds to pass down the œsophagus. At that moment the reticulum is strongly contracted to about the size of a fist, and for twenty-five to thirty seconds the mass passes into the rumen while the reticulum contains a quantity of gruel-like material: under the influence of the antiperistaltic movements of the rumen the reticulum relaxes and the mass, assisted by movements of the omasum, passes from the rumen into lower parts of the alimentary tract.

Belching was stimulated by introducing the arm into the rumen and artificially irritating the cardiac portion of the œsophagus: it was thought that

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this irritation of the œsophagus might be of some value in treating certain disorders of the fore-stomachs.

With the idea of examining the possibility of exciting movements of the fore-stomachs in cases of atonicity, an investigation was made of the reflexes to various types of fodder. After twenty-four hours of starvation diet, hay was put close to the animals and the contractions of the fore-stomachs were of course increased, but not at the expense of the frequency: at the same time it was noted that the sight and smell of corn or cotton cake increased the contractions far more than did hay or straw, and that the contractions continued for some forty minutes while in the case of the latter food the movements soon returned to normal. The investigators wondered if these facts could be turned to account in cases where it was essential to initiate peristaltic movement.

Turning to the consideration of therapeutic agents administered *per os,* it was the considered opinion of the investigators that these for the most part were quite useless in view of the great capacity of the fore-stomachs and the filtering capacity of the omasum: in cases where there was any disorder of the rumen accompanied by cessation of movement it was found that medicines given by the mouth were to be found lying inertly in the rumen seven days after administration. A number of experiments were carried out which showed that most of these agents were only of some value if introduced directly into the omasum.

The paper concluded by reviewing a number of experiments with new drugs, many of which are well known here. Naphthalene in doses of up to 50 gm. was used with considerable success in the treatment of colic; it was moreover noted that naphthalene preparations, depending on the type and dose, might exert an influence on the para-sympathetic system in one case and on the sympathetic in another, a matter of outstanding importance in the treatment of enteralgia of the intestines.

R. H. A. Merlen.

REVIEWS

Diseases of Poultry, by T. Hungerford, B.V.Sc., H.D.A. Sydney and London: Angus & Robertson. Price 63s.

Although written in the first instance (1939) for poultry farmers, " Diseases of Poultry " soon became the standard reference work for the course on poultry diseases in the Faculties in Veterinary Science at both Sydney and Queensland Universities. It has now been re-written and is up to date with the latest developments for the control of poultry diseases.

The author has lectured in veterinary science at Hawkesbury Agricultural College and also at Sydney University, but he is now a specialist practitioner in poultry disease control and is regarded as an authority on the subject in Australia.

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The arrangement of the text is quite unique and best suited to the layman. The list of diseases dealt with does not constitute all those of commercial poultry; they have been dealt with in order of practical importance. For this reason the first main chapter deals with "Roup" diseases; then follow the diseases of chicks and young stock, and those related to paralysis and leg weaknesses. There is also a chapter on those diseases in which diarrhœa is a common symptom; and a further one dealing with deficiency diseases. The two last chapters on diseases of turkeys and ducks could, however, well be omitted, because much similar material is included in the general text under the specific diseases concerned.

There is a good glossary, but the index appears to have been produced somewhat hurriedly. For example, penicillin is only mentioned on page 390, whereas there is an equally important reference on page 389, and others throughout the text. The index does not include fowl paralysis nor deep litter.

Throughout the book there are a few inconsistencies; thus page 38, "It has long been recognised that green feed is a necessary portion of the ration," yet on the following we read, "Some large farms have not fed any green feed at all for years, and have carried on with success."

The author has obviously read most of the American publications and abstracted the essential information, but it is a pity, perhaps, that he has not paid quite the same attention to literature published in this and other countries. This is especially true of Newcastle disease, but this may well be because Australian farmers have not suffered from this malady to the same extent as British poultry-keepers.

There are some 80-odd photographs, but a number of them have not reproduced well and would be better eliminated in future editions. Figure 35 draws readers' attention to a *yellowish* abscess in the left lung, but it is obviously difficult to identify such a colouring in a black-and-white photograph; and Figure 39 may, or may not, be upside-down, but it is certainly better understood in this position. Then Figure 45, on cæcal coccidiosis, gives little information which is not obtainable from Figure 44.

In view of the experimental work which has been carried out in Queensland for heat stroke, the paragraphs dealing with this malady are not as good as one might have expected, and in connection with fowl typhoid, no mention is made of blood testing for the control of this infection.

The author considers that the presence of egg material in the abdominal cavity (internal layers)—a condition better known as "yolk bound" in Australia—is common in high-producing hens confined, with little exercise. This is not our experience, however, with pullets housed in hen battery cages.

It is most interesting to learn of the appearance of vent gleet in three-week-old chicks in Australia, and also that blackhead is common in chickens (as well as turkeys)—especially following fowl pox vaccination (in New South Wales)—but this condition must be rather difficult to diagnose when the chicks are only off colour and when there are no typical lesions found at post-mortem examination.

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Poultry disease enthusiasts will want to obtain a copy of this book for their library, and Australian poultry-keepers will doubtless obtain all the information they need, for it is a very comprehensive book in many respects.

HEN BATTERIES, by W. P. Blount, T.D., Ph.D., F.R.C.S. Pp. viii + 258 with 69 Figs. London: Baillière, Tindall and Cox. 15s. net.

AN illuminating treatise on a controversial subject. The "laying cage" method of poultry husbandry originated in America about 30 years ago and a few years later it was introduced to this country by Mr. Winward. Why or when the title "battery" was acquired is difficult to assess or date. The reviewer knows of one owner of a large plant who wishing to increase the flow of eggs on his farm heard by accident that the battery system would be the the answer to his prayer. Thinking that the term "battery" implied some electrical method of stimulating egg production and being advised of a firm which produced "batteries," he placed an order for a small unit. When this was delivered he was so surprised that he thought that a mistake had occurred in the firm's dispatch department and that they had accidentally consigned to him goods really destined for a rabbit keeper. This is a true story and serves to illustrate the ignorance of "batteries" that was abroad only a few years ago.

The cage system has had to overcome much prejudice. It was unnatural, it was cruel, and such restricted and intensive housing was only courting disaster from disease. All these points have proved to be without sound foundation. Experience shows that the hens adapt themselves quickly to the novel conditions, they are happy, and good hygiene and nutrition can be applied with ease, and disease can be kept at bay with greater facility than is the case on the free range of the farm or backyard.

Eggs are produced in greater numbers so that economic factors are satisfied, and in their appearance and nutritional standard they equal the best of farm eggs.

Dr. Blount has been recognised for many years as a leading authority in poultry husbandry. By making a practical and scientific investigation of the battery method he has rendered the industry a most useful service. His observations are not those of the armchair critic but the result of a factual test.

In his book every facet is reviewed with a clarity which dispels conjecture as regards the economics of the method and, we are pleased to say, any doubts that may have troubled the public on the question of cruelty.

Plant, management, foods and feeding, and costing are all discussed and a very useful chapter on disease is included. The index is extensive and it would be difficult to pose any question to which an answer is not given in the text. The format is good and the illustrations are reproduced excellently.

Dr. Blount and his publishers have done a good job. Experienced battery keepers can profit much from a perusal of this book. Those who lack experience and even the novice will find in its pages a complete guide and a store of information which will enable them to avoid a beginner's hazards.

Veterinary surgeons will find it to be a most useful reference book.

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NOTICE

The Kennel Club and the Animal Health Trust

THE Committee of the Kennel Club announce that in future, by mutual arrangement, all appeals for support for the Canine Research Fund of the Animal Health Trust will be conducted jointly by the Club and the Trust.

It is felt that this arrangement, which will involve the closest co-operation between the two organisations, will be welcomed by canine enthusiasts everywhere. It will permit of certain economies in the administration of the Trust, as well as a considerable extension of facilities for support. At the same time, the Kennel Club cordially welcomes this opportunity of closer identification with the invaluable scientific and educational work of the Trust in the canine field. The Kennel Club has demonstrated its sympathy with the Trust by regular annual donations since 1946.

The Animal Health Trust has expressed its warm appreciation of the new arrangements. The work of the Canine Research Station at Kennett, near Newmarket, is becoming widely known and appreciated as a unique and much-needed service to canine health.

Already the Trust has been able to undertake—with encouraging results—studies on various virus diseases, such as distemper, so-called "hard-pad" and contagious canine hepatitis, and on night-blindness in dogs. Both these studies are proving of value also to human medicine. Practical studies are also in progress on the treatment of fractures and strains, and a consultative and laboratory diagnosis service available to practising veterinary surgeons is also being developed.

The Kennel Club will seek further, in the *Kennel Gazette* and in other ways, to publicise active work done at the Station, and to enlist the willing and sympathetic support of canine societies, clubs, and individual breeders and owners for this work which is clearly vital to future progress towards higher standards in canine welfare.

Publishers' Notices

THE BRITISH VETERINARY JOURNAL, with which is incorporated THE VETERINARY JOURNAL, is published monthly, and copy for advertisements should be in the hands of the advertisement manager not later than the 20th of the preceeding month, if proof is required. Tel.: Temple Bar 3386.

Letters for the Journal, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

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